C1 cont.

a stationary phase bound to the posts, said posts providing interaction with an analyte introduced into said channel for producing separation, wherein said analyte is electrically insulated from said substrate.

23. (New) The device of claim 17, wherein said substrate is of silicon.

24. (New) The device of claim 17, wherein said insulation layer is silicon oxide.

25. (New) The device of claim 24, wherein said silicon oxide is grown by thermal oxidation of silicon.

26. (New) The device of claim 24, wherein said silicon oxide layer is deposited using a deposition technique.

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27. (New) The device of claim 17, wherein said plurality of posts are spaced apart from each other by no more than 5 microns measured edge to edge.

28. (New) The device of claim 17, wherein said plurality of posts in said separation channel are arranged at least one of periodically, semi-periodically, and randomly.

29. (New) The device of claim 17, further comprising means for applying electrical potential to a fluid at one or more locations in said channel.

30. (New) The device of claim 17, wherein said substrate defines at least one additional channel, said at least one additional channel containing a plurality of posts fabricated from said substrate and extending from and perpendicular to a bottom of said at least one additional channel.

31. (New) The device of claim 30, further comprising means for applying electrical potential to fluids at one or more locations in said at least one additional channel.

32. (New) The device of claim 17, further comprising controlling circuitry for said chemical separation device integrated on said substrate.

33. (New) A chemical separation system, comprising:

a first substrate having a first surface and a second surface, said first substrate defining

(a) an entrance opening on said first surface,

(b) a fluid reservoir recessed from said second surface,

(c) a first channel extending between said entrance opening and said reservoir,

(d) a second channel recessed from said second surface, and

(e) a plurality of posts extending from and perpendicular to a bottom of said second channel;

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a cover substrate attached to said first substrate to enclose said reservoir and said second channel adjacent said cover substrate; and

an insulating layer grown on the surface of said substrate, said cover, said reservoir, said first channel, said second channel, and said plurality of posts;

wherein at least one of said first substrate and said cover substrate defines an exit; and

wherein said second channel extends between said exit and said reservoir.

34. (New) The system of claim 33, wherein at least one of said first substrate and said cover substrate is of silicon.

35. (New) The system of claim 33, wherein said insulating layer is silicon oxide.

36. (New) The system of claim 35, wherein said silicon oxide is grown by thermal oxidation of silicon.

37. (New) The system of claim 35, wherein said silicon oxide is deposited by a deposition technique.

38. (New) The system of claim 33, further comprising a stationary phase bound to said plurality of posts, said plurality of posts providing interaction with an analyte introduced into said second channel for producing separation in said analyte.

39. (New) The system of claim 33, further comprising means for applying electrical potential to a fluid in at least one location, said location selected from the group consisting of said fluid reservoir, said second channel, and said exit.

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40. (New) The system of claim 33, wherein each of said plurality of posts are spaced apart from each other by no more than 5 microns, measured edge to edge.

41. (New) The system of claim 33, wherein said plurality of posts in said second channel are arranged at least one of periodically, semi-periodically, and randomly.

42. (New) The system of claim 33, further comprising:

a multiplicity of entrance openings on said first surface;

an equal multiplicity of fluid reservoirs recessed from said second surface;

a multiplicity of first channels extending between each of said multiplicity of entrance openings and a corresponding one of said multiplicity of fluid reservoirs;

wherein said second channel recessed from said second surface extends between said exit and every one of said multiplicity of fluid reservoirs.

43. (New) The system of claim 33, further comprising:

a plurality of additional entrance openings on said first surface;

a plurality of additional reservoirs recessed from said second surface, each additional reservoir corresponding to one of said plurality of additional entrance openings;

a plurality of additional first channels, each corresponding to and extending between one of said plurality of additional entrance openings and its corresponding additional reservoir; and

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a plurality of additional second channels recessed from said second surface, wherein one of said first substrate and said cover substrate defines a plurality of additional exits, each additional exit corresponding to one of said plurality of additional reservoirs;

wherein each additional second channel corresponds to and extends between one of said plurality of additional reservoirs and said corresponding additional exit.

44. (New) The system of claim 43, further comprising at least one means for applying electrical potential to fluids at one or more locations in said plurality of additional fluid reservoirs, additional second channels and additional exits.

45. (New) The system of claim 43, further comprising controlling circuitry for said chemical separation system, said circuitry being integrated on at least one of said first and said second substrate.